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Service Data Management

IADS User Group Conference

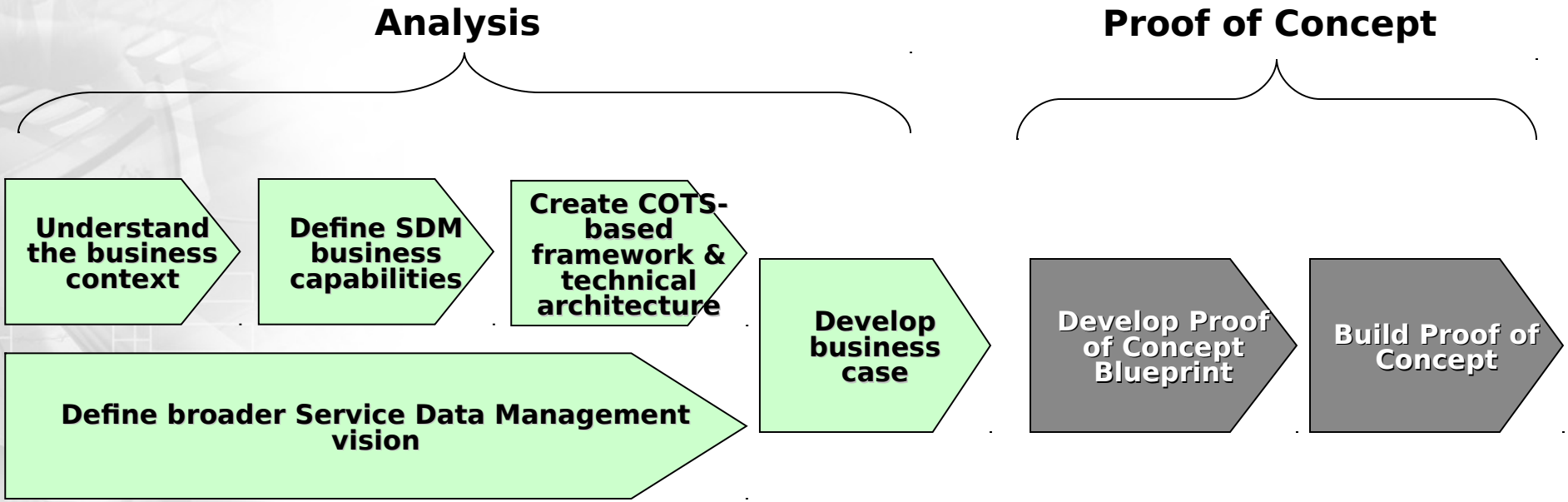
7 April 2004

Agenda

- Service Data Management Analysis Overview
- Proof of Concept Build Overview
  - Release 1
  - Release 2
- S1000 Data Conversion Approach

Service Data Management Overview

The Service Data Management effort involved interrelated objectives, leading to the broad vision for Service Data Management as well as a COTS-based framework and supporting business case for technical manuals/technical orders.


Analysis
Proof of Concept
Understand the business context
Define SDM business capabilities
Create COTS-based framework & technical architecture
Develop business case
Develop Proof of Concept Blueprint
Build Proof of Concept
Define broader Service Data Management vision

Service Data Management Vision

The Service Data Management vision focuses on enabling the service management enterprise of the DOD, supporting a broad array of service functions.

Service Management Integration

Tech Support / Knowledge Mgmt

Technical Support

Product Documentation / Service Bulletins

JIT Training

Product & Process Insight & Data Mining

Service/Maintenance Fulfillment

Service Program Planning

Capacity Planning

Finite Capacity Scheduling

Service Execution

Repair / Work Order Management

Asset Management

3 Dimensional Configuration Management

Remote Monitoring

Diagnostics Prognostics & Testing

Asset & Fleet Utilization Optimization

Reverse Logistics

Return Material Authorization & Processing

Transportation Management

Warranty Management

SLA & Performance Management

Contract & Warranty Management

Collaborative Product Design Management

Design for Reliability and Serviceability

Product Defect Management (6Sigma/FMEA)

Part Master Hierarchy/ Catalogs

Product Data Mgmt / Product Lifecycle Mgmt

Service Parts Logistics

Demand Visibility and Planning

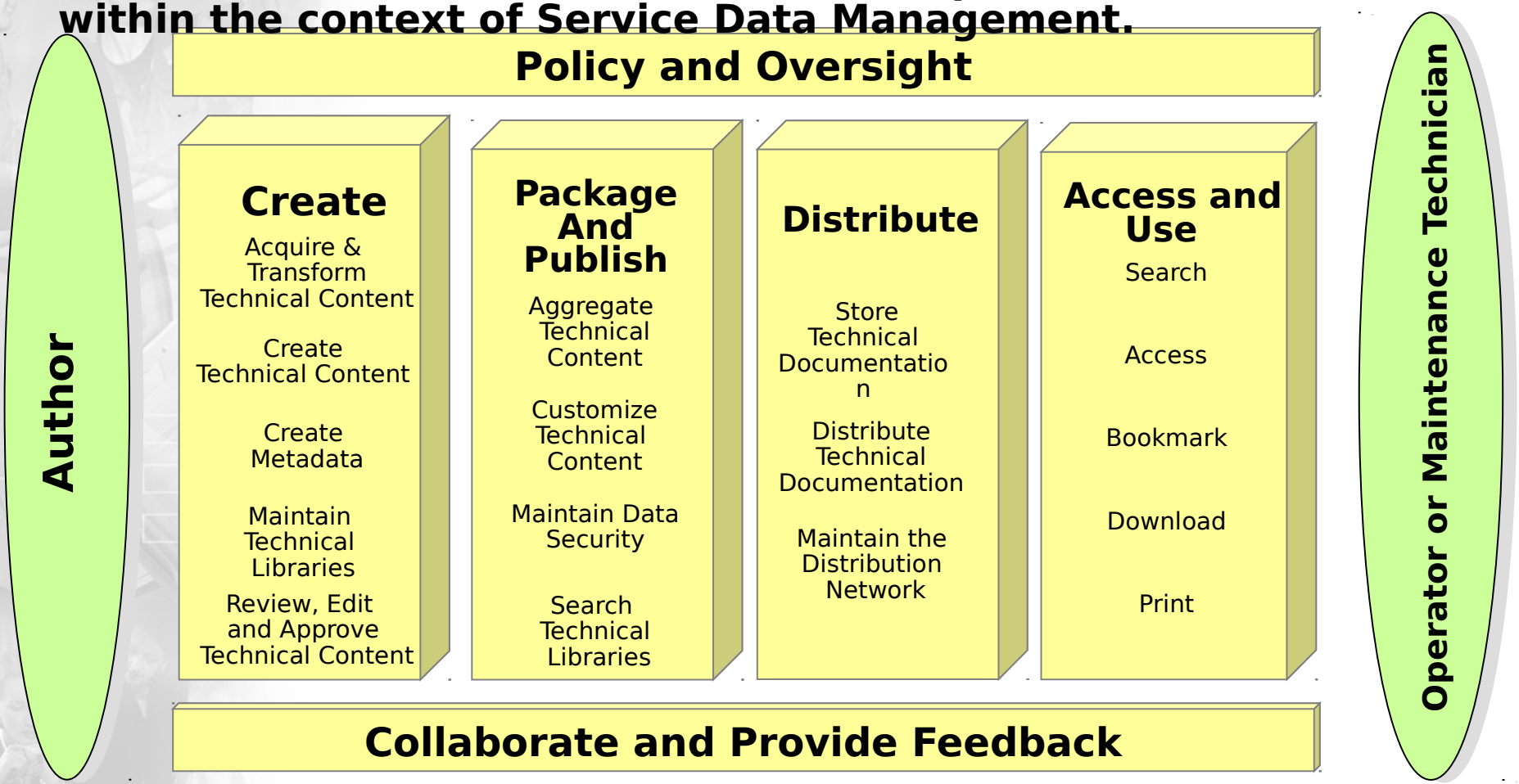
Strategic Sourcing & Procurement

Inventory Allocation & Warehousing

Delivery Logistics & Fulfillment

TM Business Capability Framework

We documented the needed business capabilities for TMs within the context of Service Data Management.



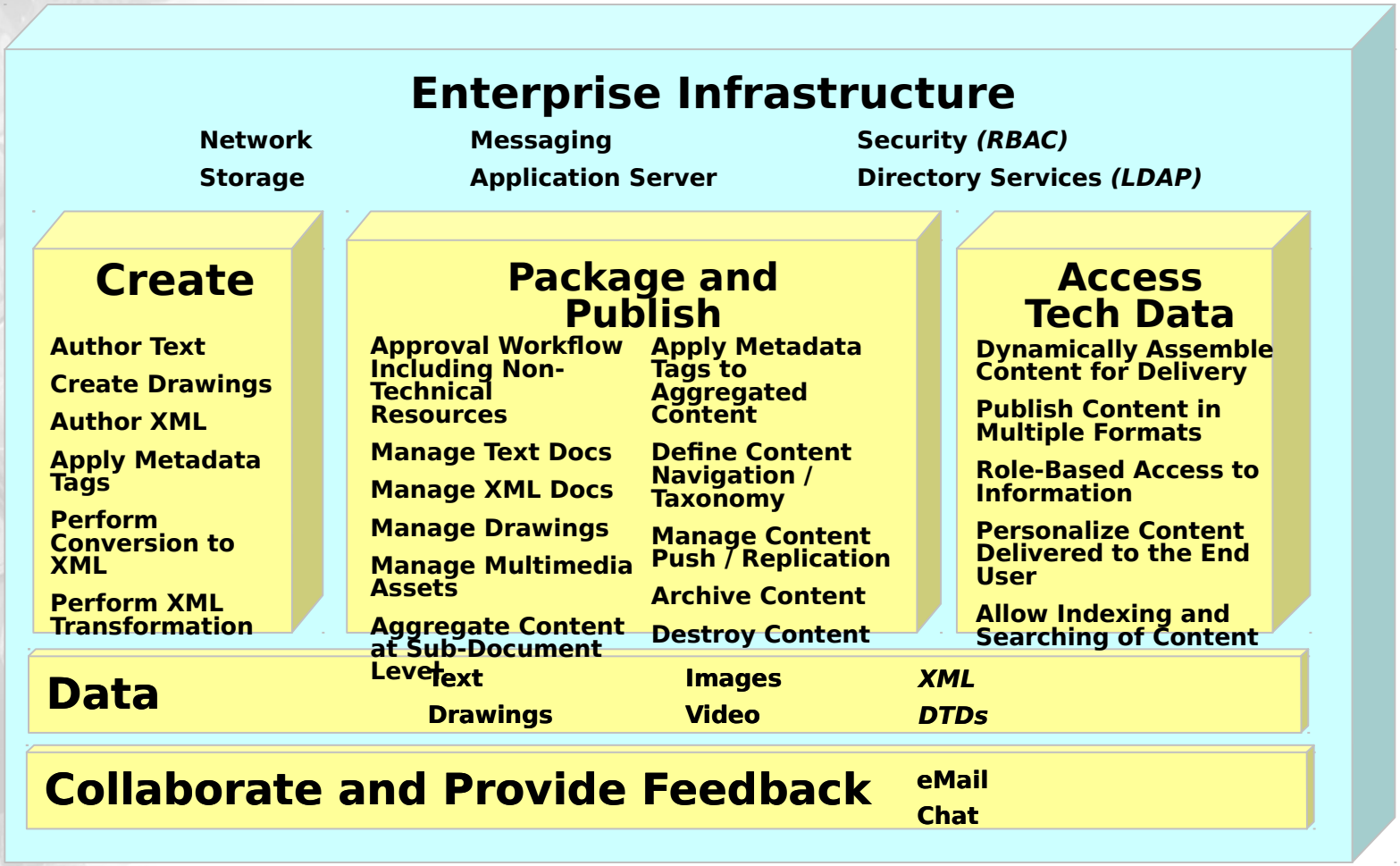
SDM Electronic Technical Manual Evolution

Service Data Management seeks to transform how technical manuals are developed and used within the context of the logistics enterprise.

Legacy Initiatives	SDM Driving Forces
Custom-built applications	COTS software and hardware products
Document-centric standards	Commercial, content-centric standards – AECMA S1000D
“Stove-piped” solutions	Integrate with the broader logistics enterprise

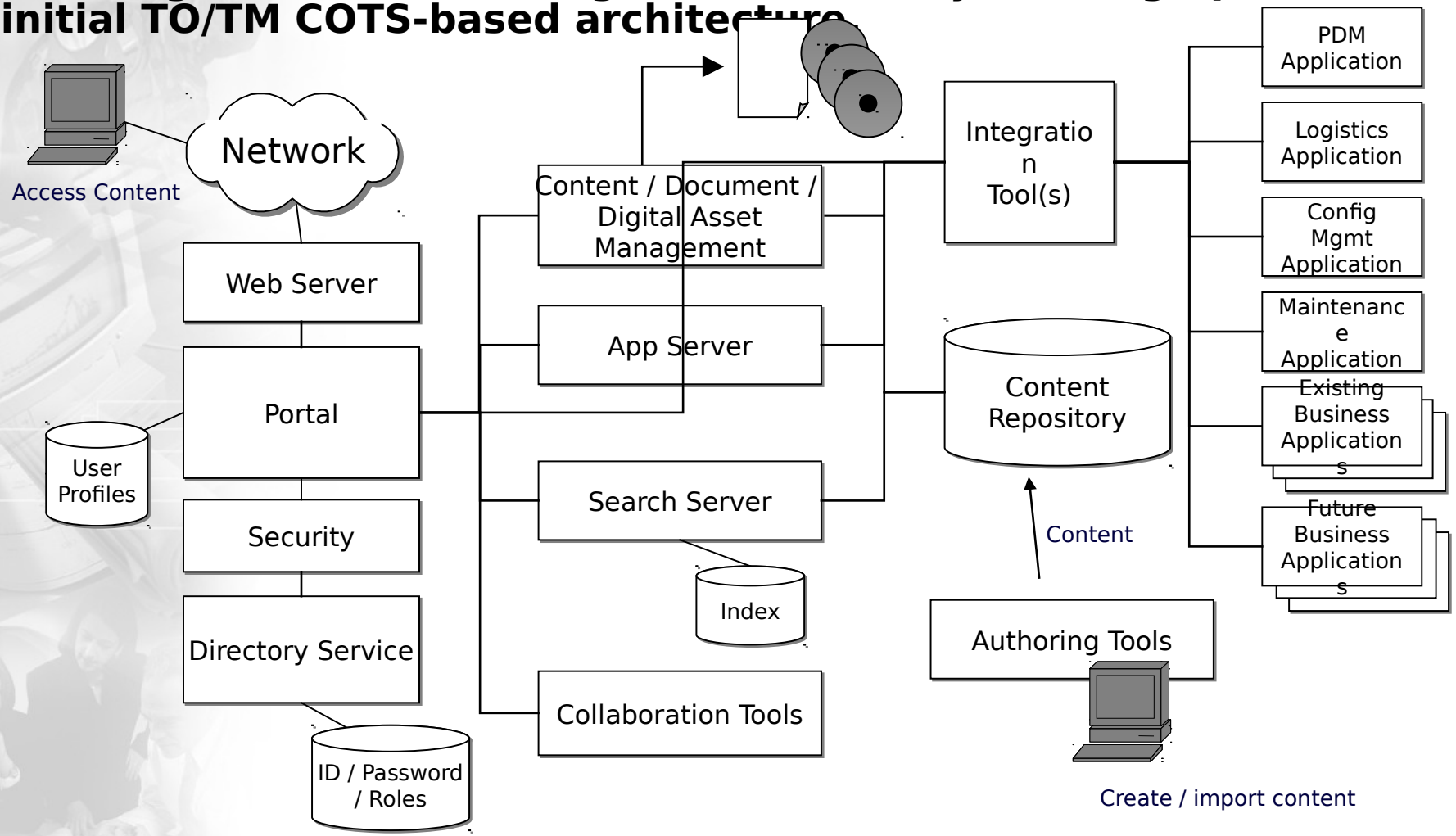
TM COTS-Based Technical Framework

By focusing on these guiding principles, the COTS-based technical framework applies commercial standards to deliver technical content based on Service Data Management.



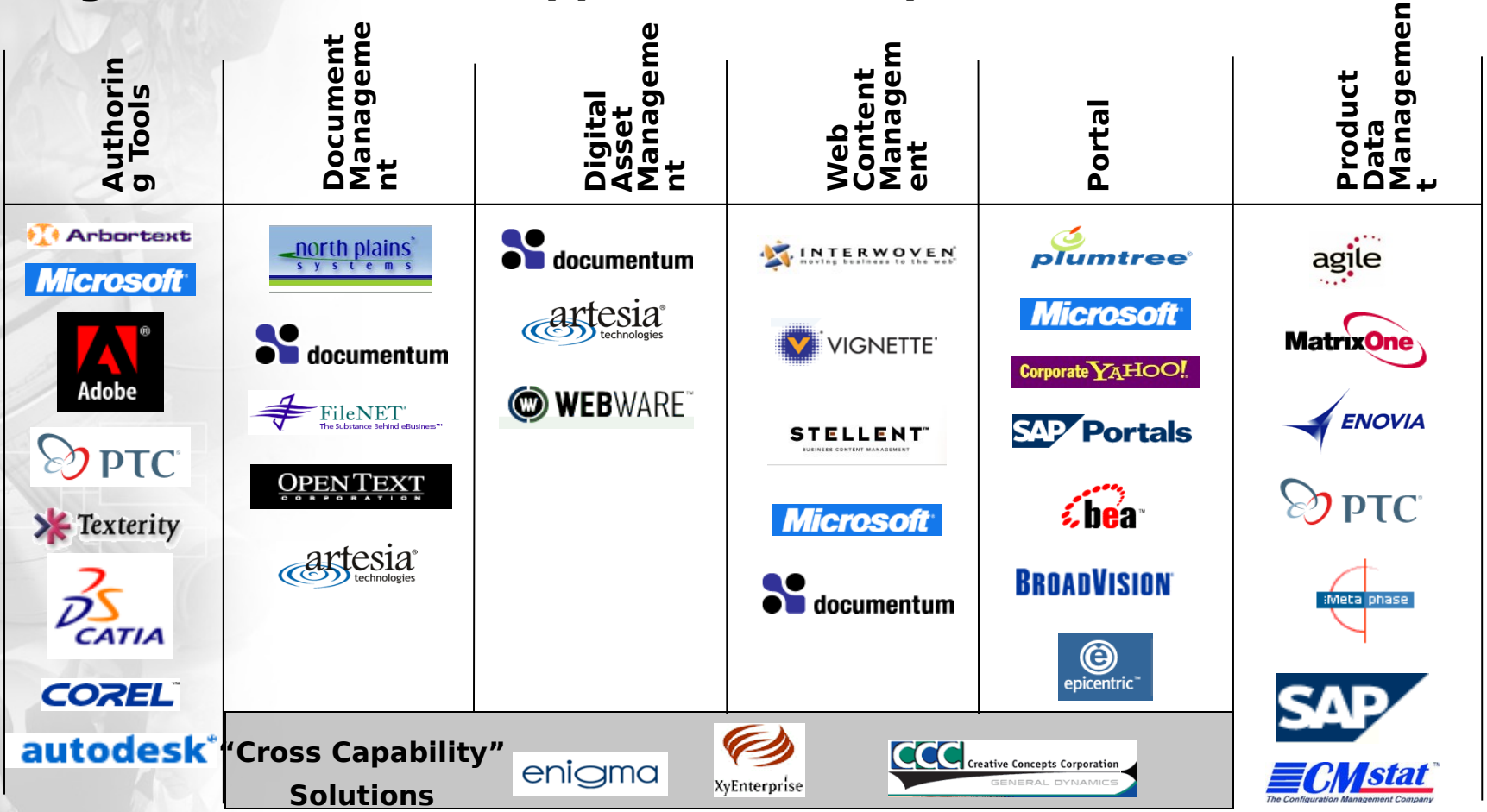
Service Management System Architecture

As a technical architecture, the framework is extensible, enabling the Service Management Vision by building upon the initial TO/TM COTS-based architecture



COTS Products Capabilities

Industry provides a robust solution set across multiple product categories that can be applied to TM capabilities.



Note: Provides a representative list of products. Vendors within each category are working to expand functionali
broader capabilities. This listing is not intended to be a product recommendation.

Source: Vendor product descriptions; Accenture analysis

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SDM Proof of Concept Overview

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Objectives of Proof of Concept

Based upon the outcome of analysis, OSD tasked us to develop a POC to achieve specific objectives.

- **Develop a working reference model of the SDM COTS-based framework**
- **Prove out the technology, process and approach for the development of SDM-based technical manuals**
- **Generate lessons learned to accelerate future SDM activities**
- **Leverage existing functional and technical environments and plans to generate a “real life” POC**
- **Demonstrate the applicability of commercial technical content standards**
- **Demonstrate and explore the business benefits of using an SDM COTS-based approach for development and use of technical content**
- **Demonstrate how technical content can be used both in technical manuals as well as integrated with enterprise systems**

Service and Weapon System Selected

After reviewing several weapon systems across all of the Services, OSD chose the T700 engine for the POC.

Weapon System Selection Criteria

1. **Weapon System Characteristics**
   - Weapon System Status (in-service, under development)
   - Stable Configuration
   - Data Ownership / Data Rights
   - Asset Complexity
2. **Current TM Functional and Technical Environment**
   - Current Logistics Systems
   - Compatible Technical Architecture
3. **Compatible Future Technical Environment**
4. **Support and Sponsorship**

T700 Selection Rationale

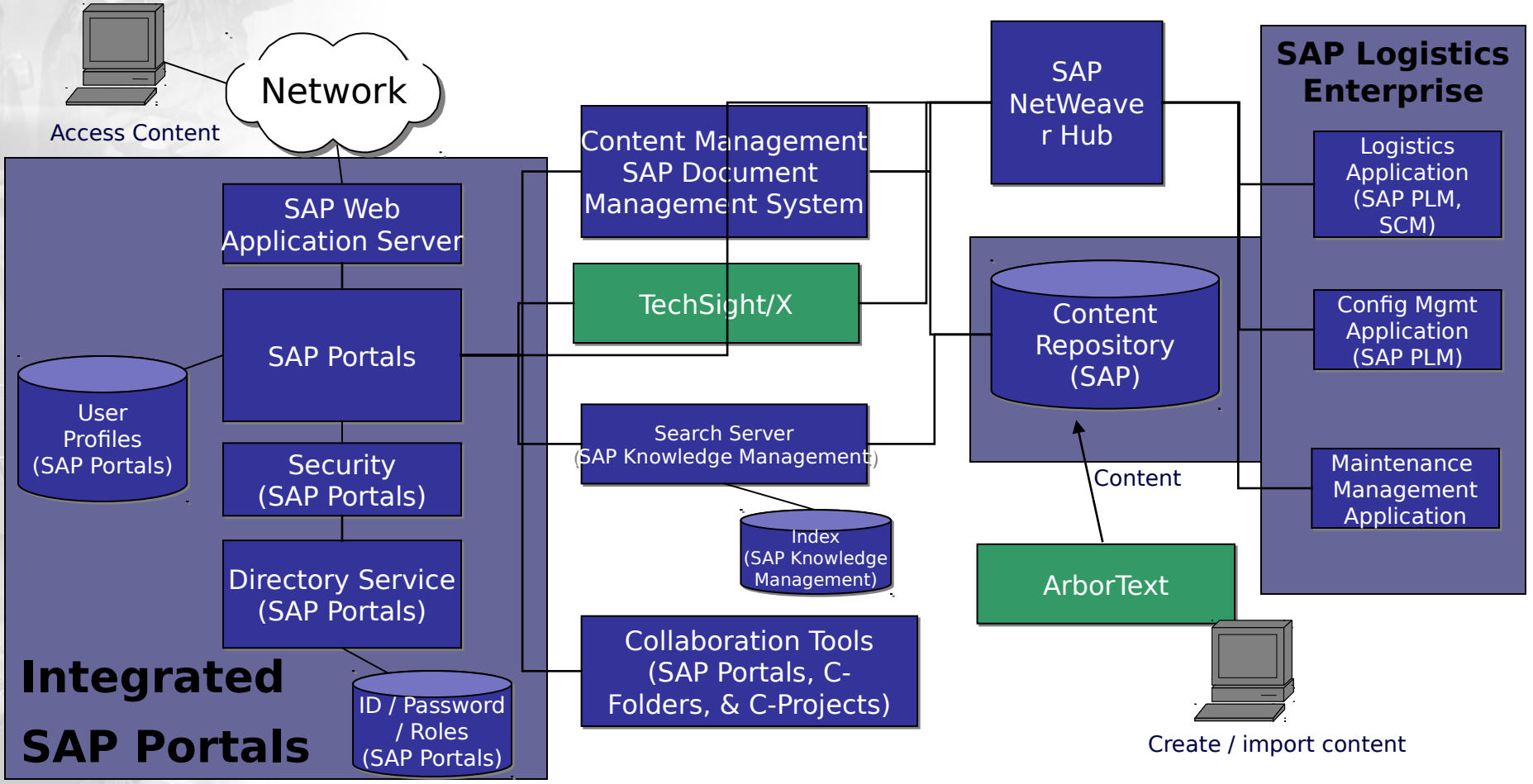
- Stable system for many years Reasonably complex asset includes engines, airframes and avionics.
- Multiple configurations across services creates an excellent opportunity for tail-specific predictable maintenance.
- Services weapon system managers and logistic leadership enthusiastically support introducing the ETM and Service Data Management. They will act as change agents in the proof of concept.
- Asset requires field, depot and overhaul maintenance. Technical Manuals have been made available over the internet

Specifically the T700 engine …

- T700 is one of the most prevalent engines in the DOD. It provides power to the AH-64, UH-60, AH-1 and UH-1Y. It is a stable platform that has stable data in multiple formats.
- The T700 IETM Proof of Concept may also leverage Joint Aviation Technical Data Integration (JATDI), Modern Health and Usage Monitoring System (HUMS), Aviation Total Life-cycle Assessment Software Tool (AT LAST)

Proof of Concept COTS Based Technical Architecture

We will leverage SAP to the greatest possible extent, consistent with the Single Army Logistics Enterprise. We worked with SAP to identify and address gaps in current SAP functionality.



Release 1 of the POC

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In Release 1, we will demonstrate Service Data Management technical manual capabilities, starting with the "Day in the Life" of a Documentation Specialist.

Release 2 of the POC

In Release 2, we will demonstrate Service Execution, JIT Training, Part Master Hierarchy/Catalogs, Asset Configuration Management and Service Part Delivery Logistics for a "Day in the Life" of a Maintenance Technician.

S1000D Data Conversion Approach

SDM POC Data Conversion

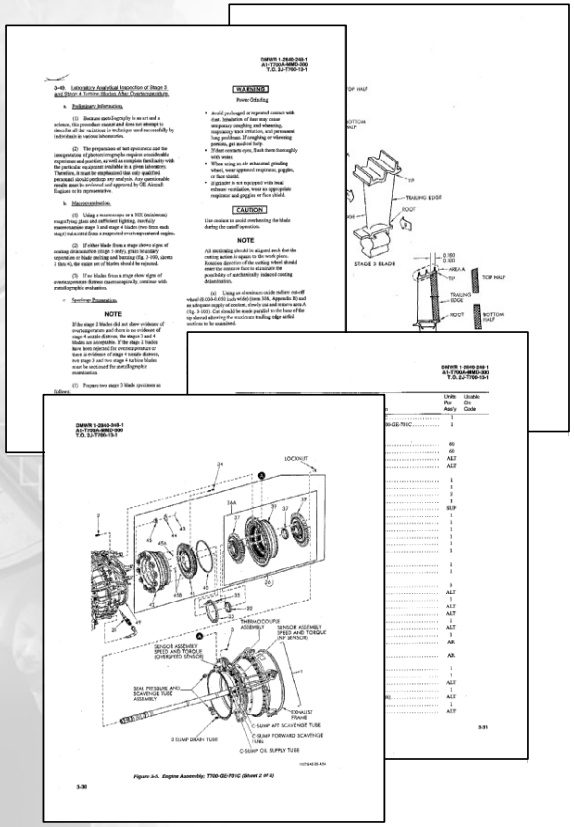
The SDM POC Team is working with Data Conversion Laboratory (DCL) to convert a portion of the T700 DMWRS manual to the S1000D data standard.

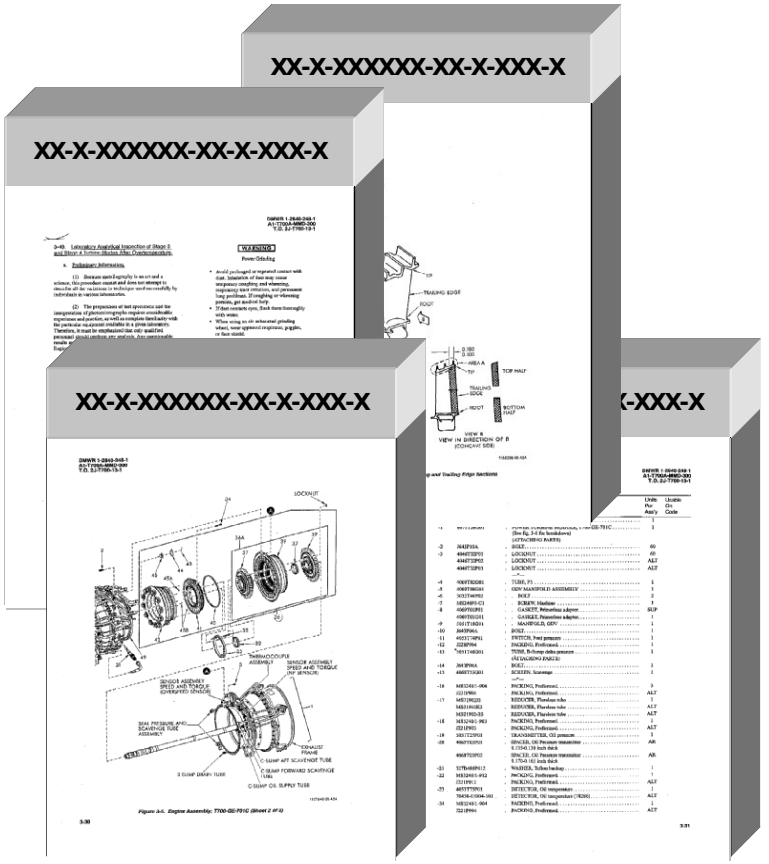
Key Data Conversion Activities

- Initial Data Mapping
- Manual Data Mark-up/Conversion
- Review of Hand Converted Data Sample
- Sample Automated Conversion
- Review of Automated Conversion Sample
- Full Data Conversion

T700 DMWRS Conversion

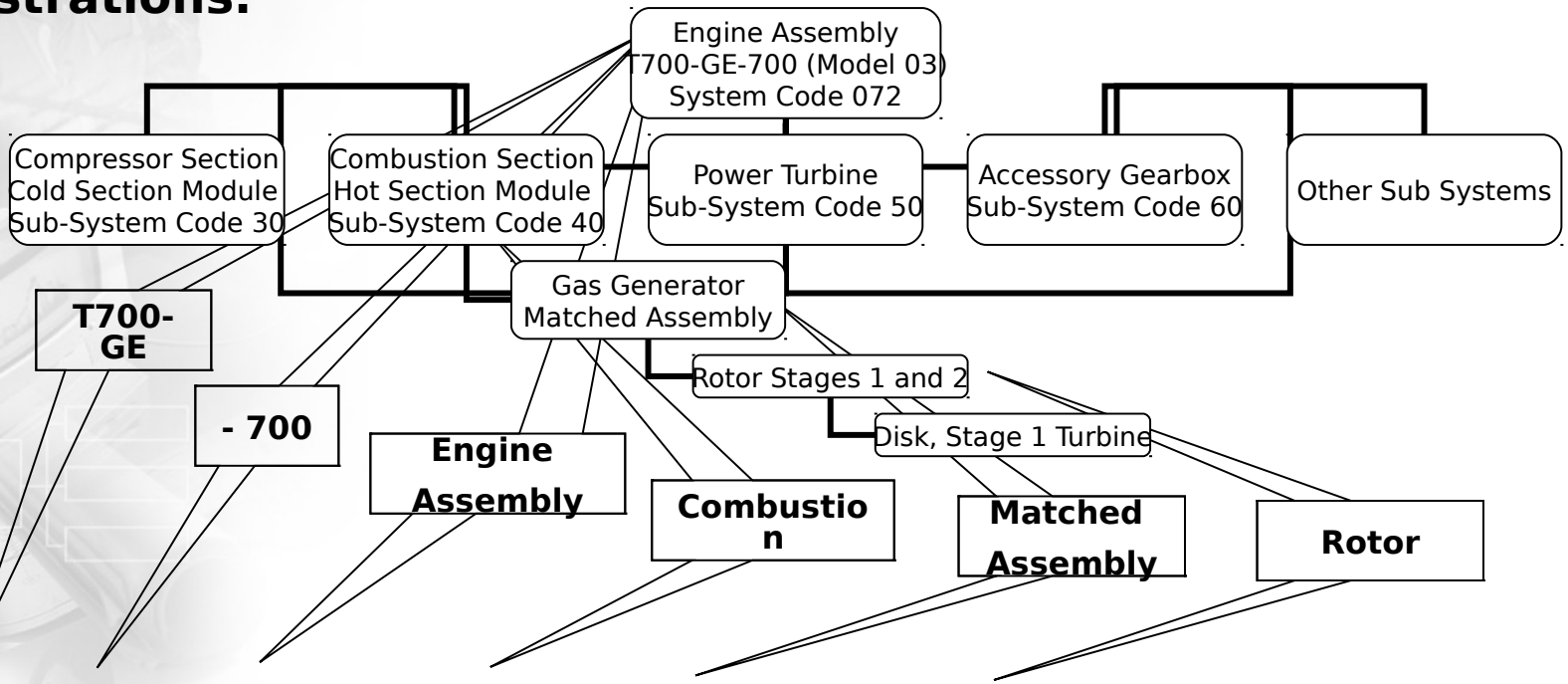
Front Matter, Descriptions, Maintenance Procedures, Illustrations, Illustrated Parts Breakdowns, … from the current DMWRs will be converted to S1000D data modules which will become the building blocks from which electronic publications are created.





S1000D Data Mapping Approach - T700 Engine Structure

Mapping the DMWR data to S1000D begins with the breakdown of the engine assembly into its components and assigning data module codes to the various maintenance procedures and illustrations.



Model	Variant	System	Sub-System	Assembly	Disassembly Variant	Information Variant	Item Location
03	A	72	40	01	Code A	Code A	C

Illustrated Parts Breakdown — 01

Bench Maintenance — 075

DMWRS Content to be Mapped for Release 1

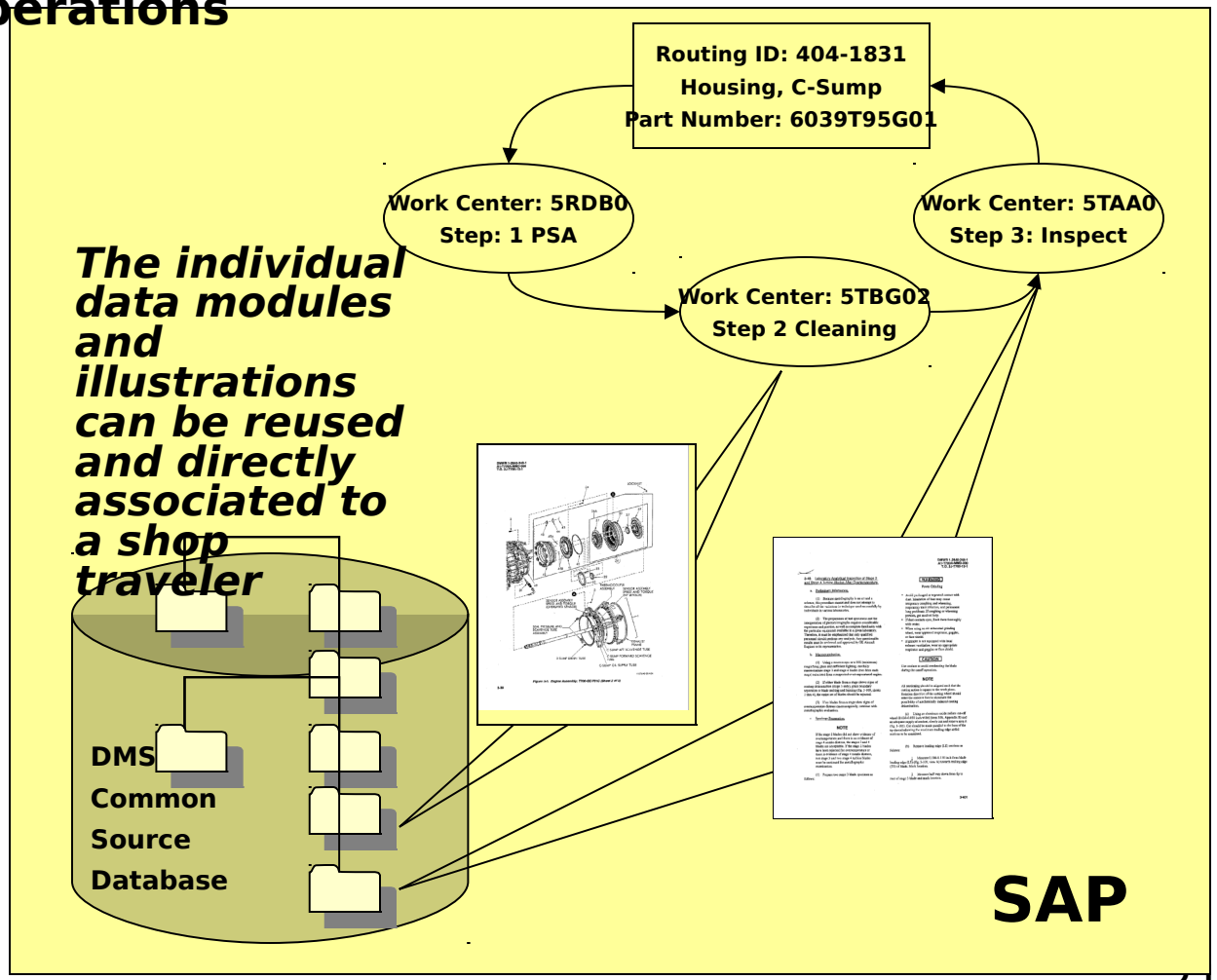
Content selected from the T700 DMWR will cover as many aspects of S1000D as possible within Release 1 of POC

- Introductory Material: The entire content of Chapter 1 of the DMWR provides a good representation of figures, text, and tables
- Illustrated Parts Breakdowns: Shows the engine assembly and then breaks down the Hot Section Module to the lowest level items that will require repair
- Repair Procedures: Provides the repair procedures for the Hot Section Module starting with removal and disassembly. These procedures are followed by the cleaning, inspection, repair of the Stage 1 Rotor.
- Assembly Procedures: Details the reassembly of the Hot Section Module.

Service Execution – Electronic Shop Traveler

For the Proof of Concept, we will create a routing simulating the Shop Traveler and associate existing data modules to provide instructions for the operations

- A Shop Traveler provides the operations and instructions based on the DMWR for depot level maintenance.
- Today, Specialists from Process Engineering prepare the shop traveler by “cutting and pasting” DMWR instructions for the various maintenance operations.



S1000D Considerations and Lessons Learned (so far)

- The structure (BOM) of the asset is critical as it drives the DMC numbering
- Easy to get lost in the content – focus on the asset structure (T700 manual is focused towards the maintenance process not the engineering BOM structure).
- Chapters, figure numbers, table numbers and cross references become meaningless when converting to data modules. The “reappear” when the data modules are organized into a publication.
- Knowledge needed includes S1000D, asset engineering definition and maintenance processes.

A Look Into The Future

With technical data developed and maintained as data modules within the S1000 specification, SDM will support the ability to…

- Dynamically configure the display of technical data based on
  - Asset configuration
  - User profile
  - Level of maintenance
- Instantly integrate technical data updates from both OEMs and internal sources based on where a component/assembly is used
- Automatically log what technical data is used during maintenance activities
- Integrate technical data within the larger logistics enterprise from acquisition of assets through the service lifecycle of the asset

How To Find Out More

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Backup Slides

Release 1 Business Capabilities

In the business scenarios for the Technical Manual Capability, we define the SDM POC processes for acquiring technical content from an OEM, creating new technical content, applying change directives and packaging the technical content into a publishable format for display.

Business Capability	Description
Create Technical Content	Capability to convert a manual to S1000D, create a new manual, change an existing manual, and store a manual on electronic document management system
Package and Publish	Capability to manage document libraries, organize modules into document, and archive obsolete technical modules
Access and Use	Capability to display DMWR technical manual on a personal computer by demonstrating the features of COTS rendering software

Release 2 Business Capabilities

For each business area in Release 2, we will explore how Service Data Management supports these business functions from a common data repository.

Business Capability	Description
JIT Training	Incorporates Maintenance Mentoring techniques at the point of maintenance
Service Execution	Execution of repairs on a major component enhanced by the capabilities of Basic and Extended Technical Manual
Configuration Management	Display of Maintenance instructions and part configuration for a specific T700 model or serial number
Part Master Hierarchy/Catalogs	Develops a parts catalog that represents the bill of materials for a component that can be displayed to a technician
Service Parts Logistics-Delivery Logistics & Fulfillment	Creates inventory locations and on-hand quantities for repair parts to be available for a technician and fulfills a requisition to issue a required repair